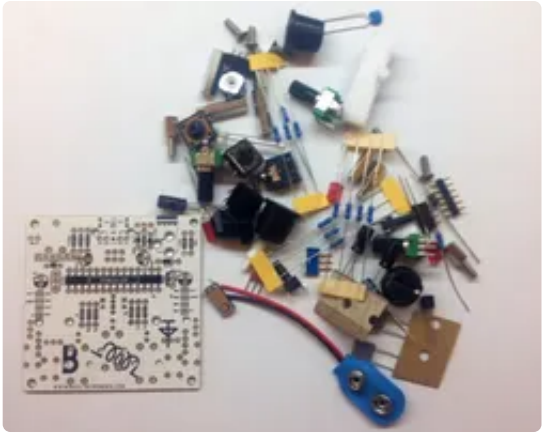
Trinity Assembly

By bastl-instruments in Circuits > Soldering 29,511 116 2 Featured

BY-NC-SA



Hey dudes!! Lets build the Trinity synth!!!

You can find more informations at our website: bastl-instruments.com

Before you start:

- The board solders from both sides.
- The components goes **always above** its printed sign, so it covers the printed sign!
- You should know that there are some differences between some of the versions.
- Please read the instructions **CAREFULLY —** especially for the power switch!

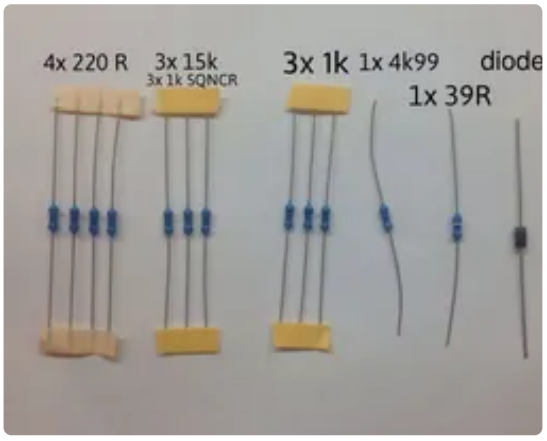
SQNCR has more buttons and 3 small LEDs instead of the RGB LED and therefore has different resistors too. Mozzi library development kit has no

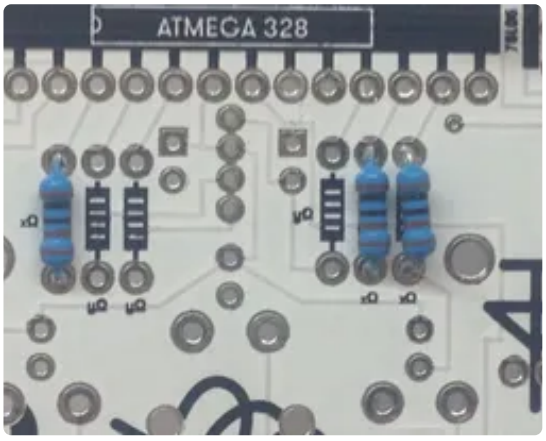
casing and the small buttons are not tall.

This instructable is now updated for both versions 1.0 and 1.1.

(*1.2 is comming soon*)

Step 1: Placing Resistors





First, lets solder all components on the component side of the PCB.

Different slots for resistors have different resistor values. Read the color stripes or measure the values with multimeter.

- **4x 220R** – red red brown (on board v1.1 three of these 220R are labeled zOhm)

- **1x 4.9K** – yellow white white brown (4.7k also works yellow violet red)

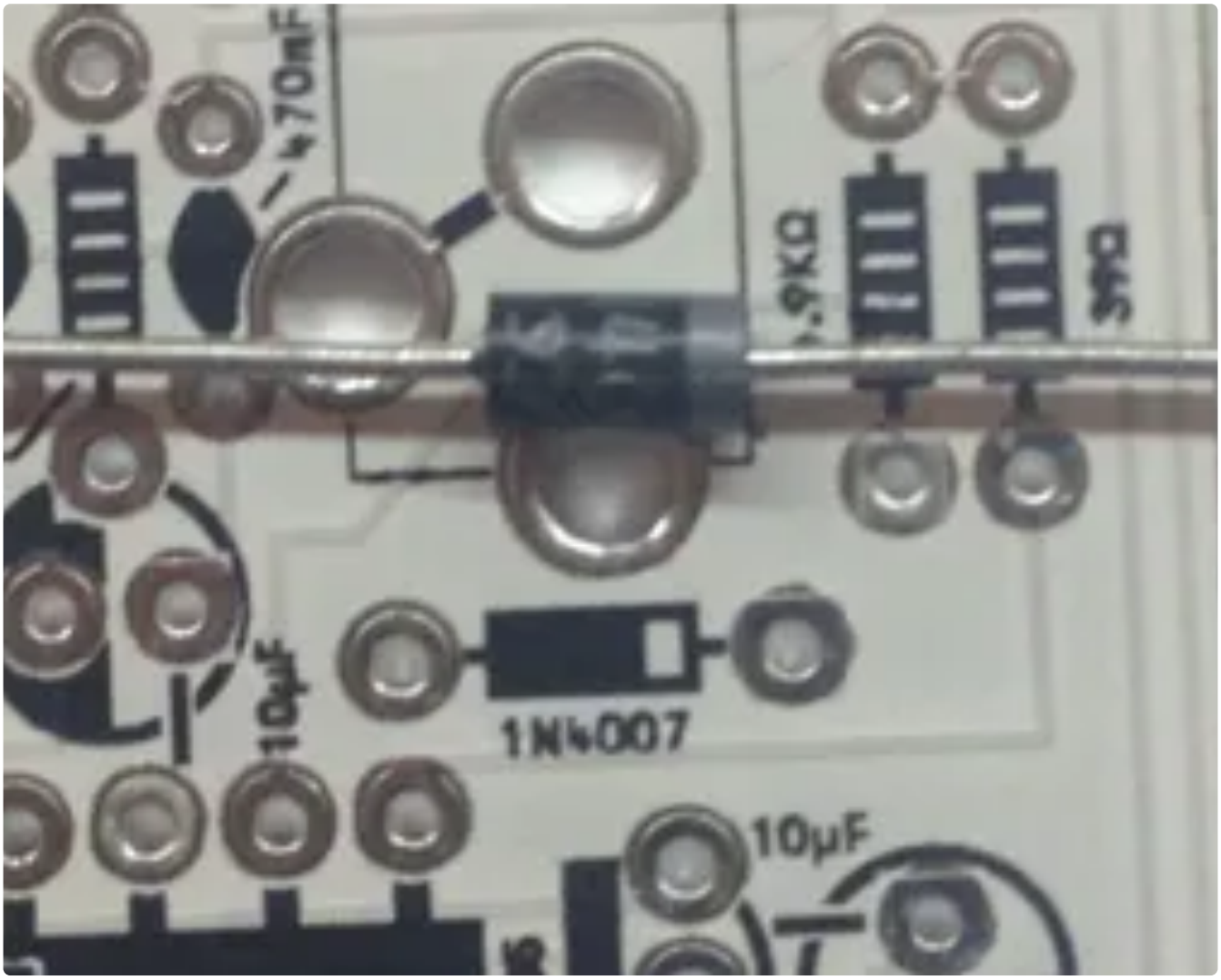
- **1x 39R** – orange white black

! BE CAREFUL !

-**3x xOhm** are **1K** (brown black red)! Read the board carefully!

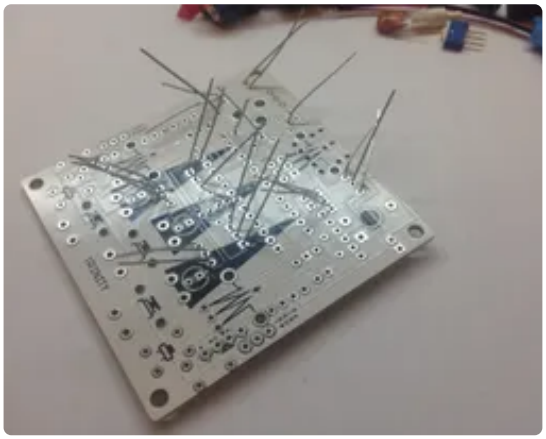
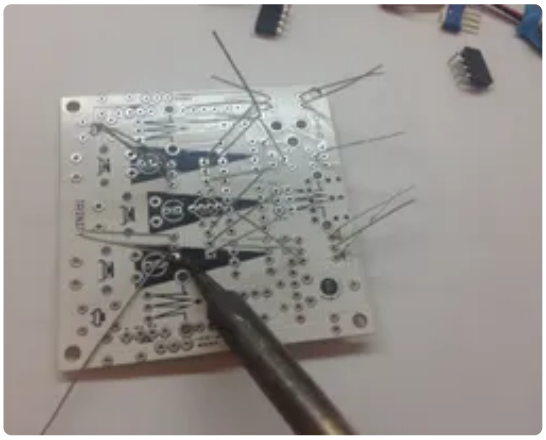
-**3x yOhm** are **15K** (brown green orange) BUT on SQNCR they are **1K** (brown black red)!

Step 2: Place the Protective Diode



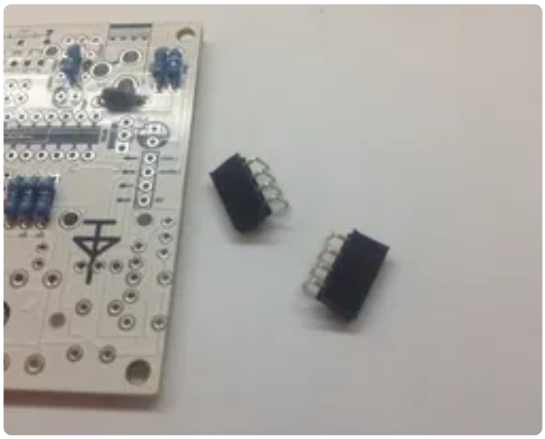
Check polarity indicated by the stripe diode.

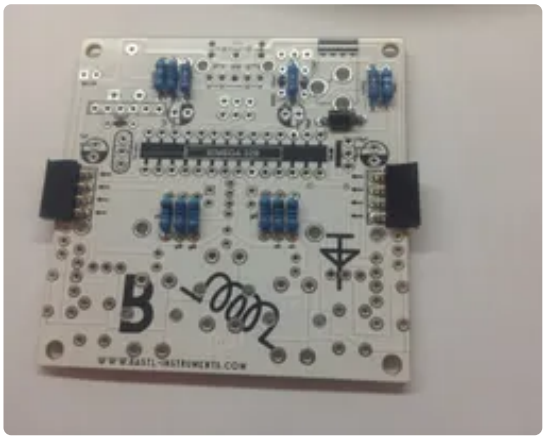
Step 3: Solder

Bend the legs of the components slightly, turn the board upside down and solder each connection properly. Cut the legs afterwards.

Step 4: Chain Connectors

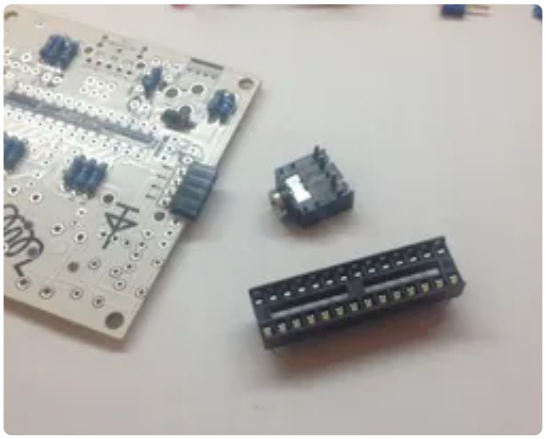


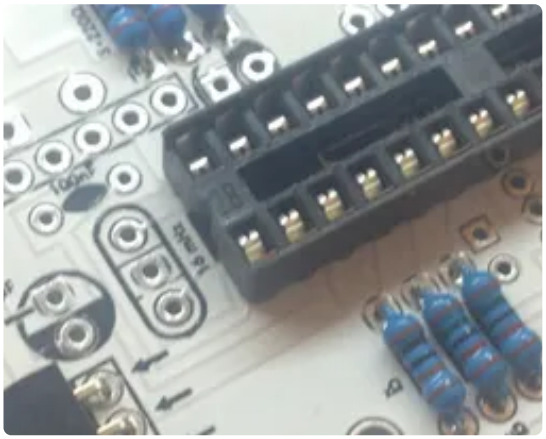


Now it's right time to solder chain connectors.

Tip: it is always good to solder least tall parts first.

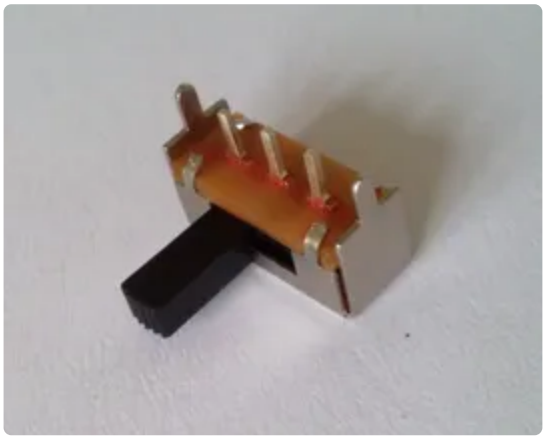
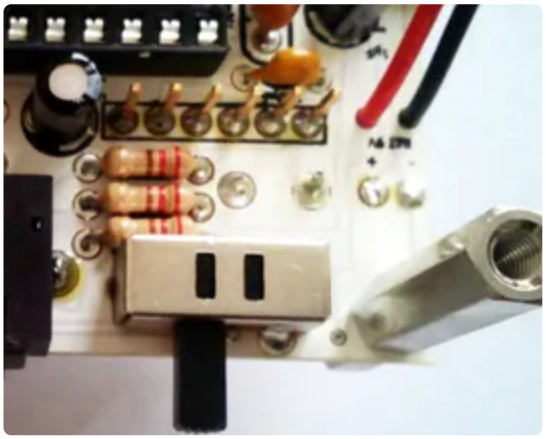
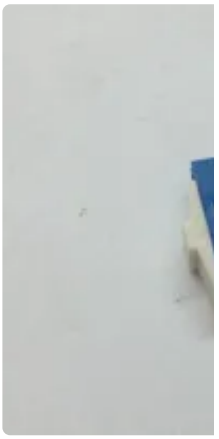
Step 5: Atmega Socket and Audio Jack





On the chip socket mind the polarity of chip indicated by the notch. On the audio connector try to solder it the way that there is NO gap between the connector and the PCB. Than cut the remaining legs of the jack. Double check that you do solder from the correct side of the PCB!

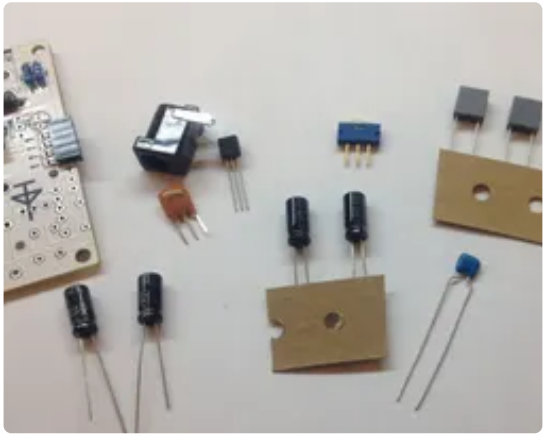
Step 6: Place the Switch

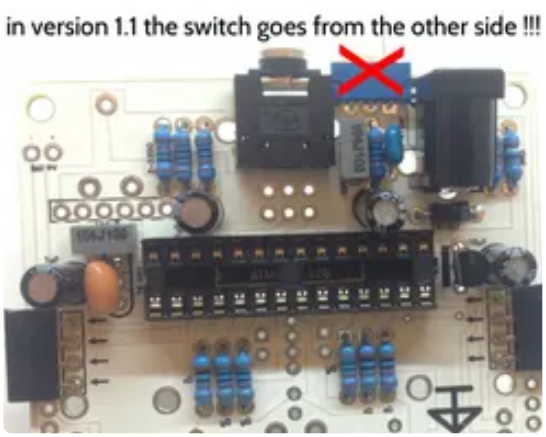




Version 1.2 have switch with black handle, ready to be placed onto PCB on corresponding place (like on picture of fully assembled Trinity).

Version prior to 1.2 have blue-white slide switch like you can see on pictures. To place it onto PCB, **carefully** bend the legs of the slide switch into right angle, but take your time and do it **ONE BY ONE!** It does not matter which side you bend them, but by not gentle bending legs, you might damage the switch.

Step 7: Capacitors, Resonator Regulator Switch Power Jack

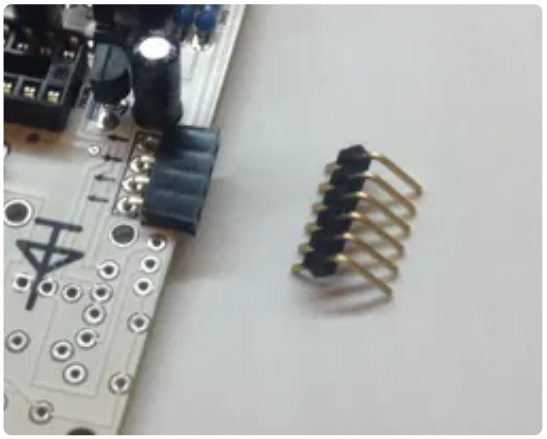


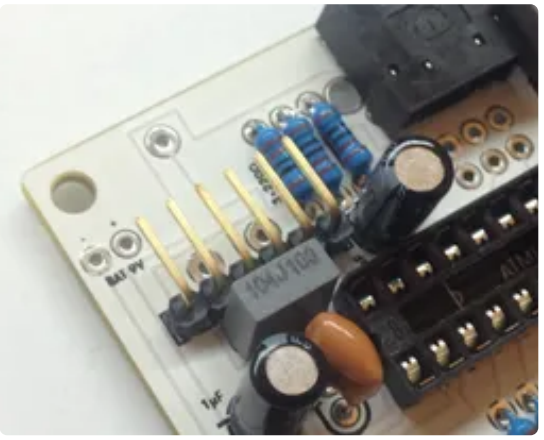


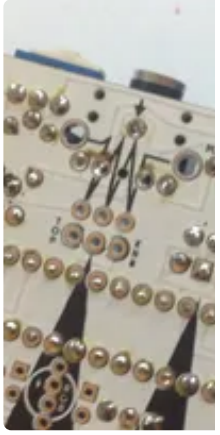
IMPORTANT:
in version 1.1 with full plastic housing the switch has to go from the other side of the board! You can clearly see it on the images.

All the other components go now on the board. Put the components and bend their legs slightly. Take care of polarity and value of electrolytic capacitors – the big ones. 16Mhz resonator has no polarity. Voltage regulator 7805 has polarity indicated. On power jack fill the holes with tin and make NO gap between the connector and the PCB.

Step 8: FTDi Break Out Connecor- the Hack Port





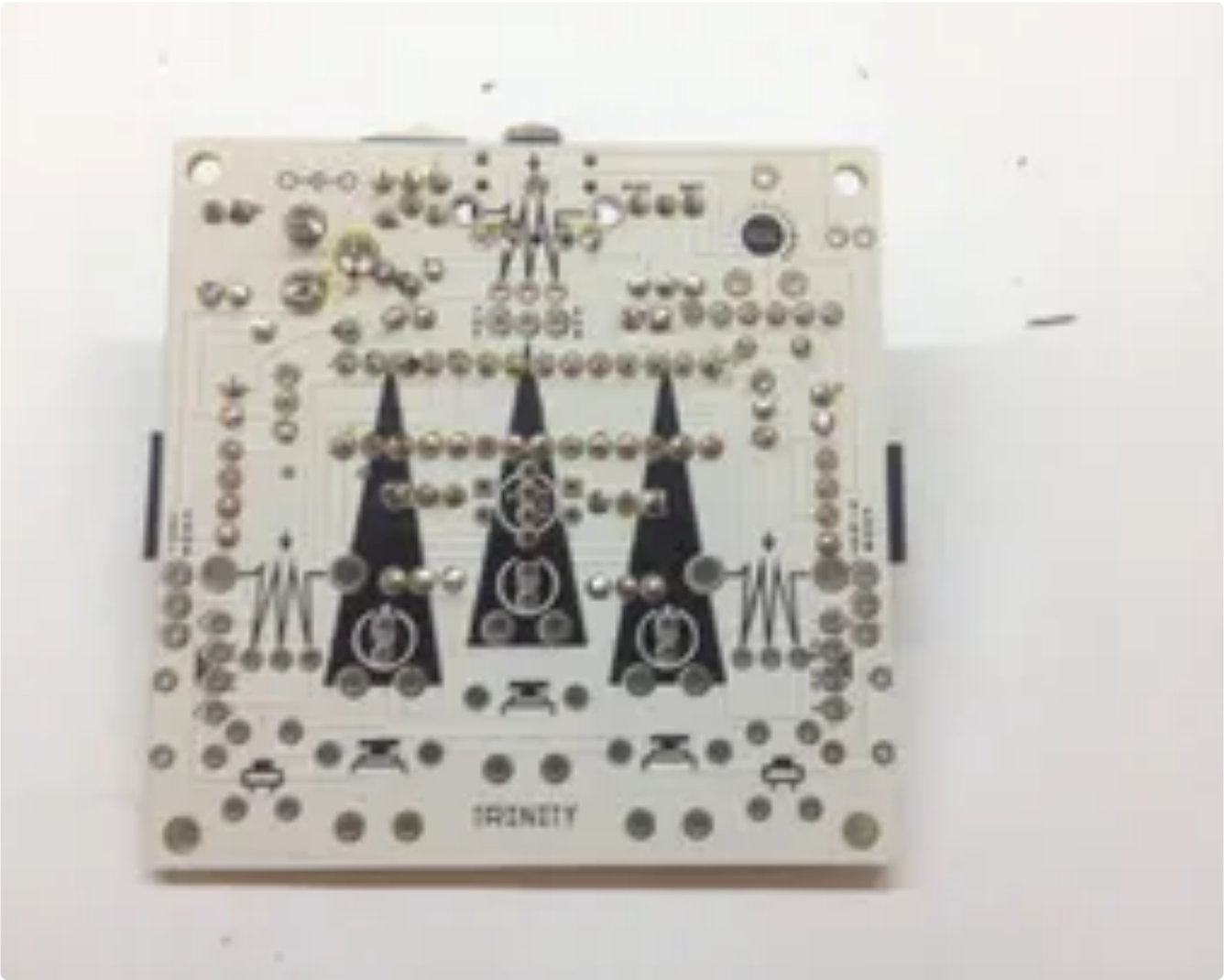


Solder

the 6 pin bent header on the right place. To hold it in the place put something like pliers underneath, or solder first and last pins first, while pushing on header and finish all remaining connections afterward.

Tip: if you manage to create some gap between header and PCB, just keep pushing the header and heat up the tin on a board. Header will end up as close as possible to PCB.

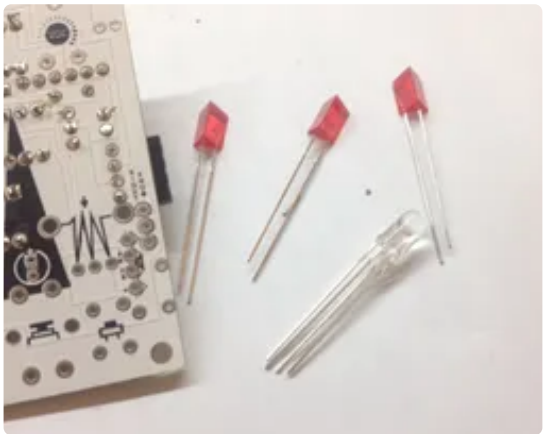
Step 9: Interface Side

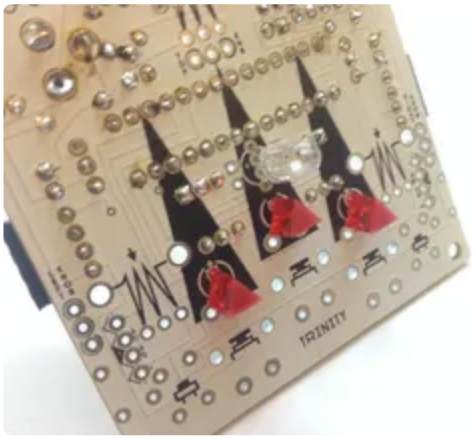


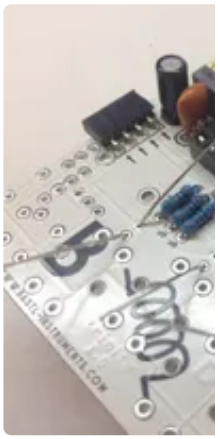
The component side is ready so lets solder from the Interface side.

Important: all the components have to be soldered straight – right angle to the board. If they are not straight you might have problems with covering them by front plate.

Step 10: Leds







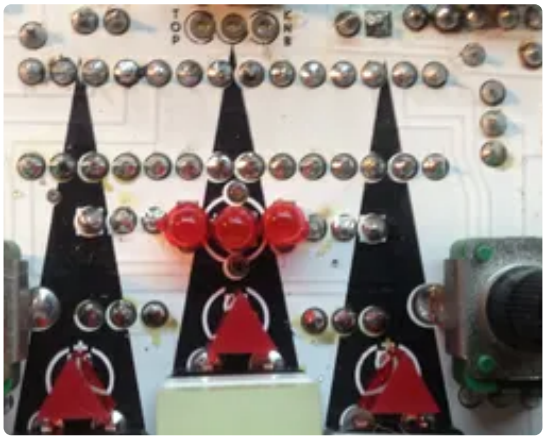
The LEDs have polarity indicated on the board. The longer leg of the LED (anode) is marked on board as +

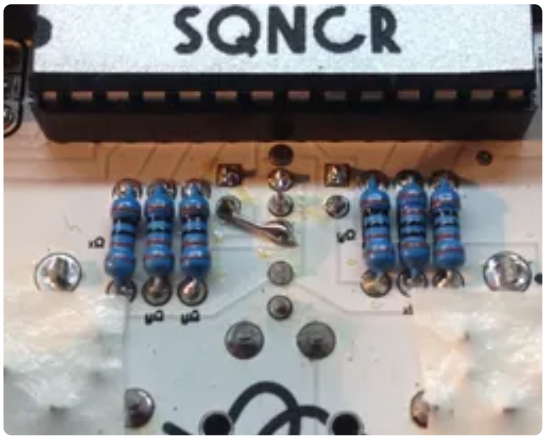
The RGB LED goes as deep as the stoppers on its legs are.

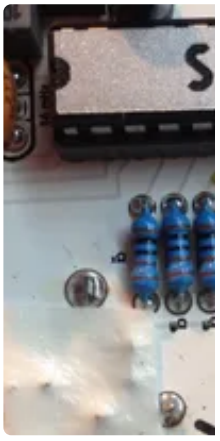
Note: on trinity board v1.0 we had to enlarge the holes of RGB LED by drilling, so the through hole connections might got lost! For the RGB LED put a bit of solder from both sides of the board to make sure the connection remains there.

For soldering LEDs on SQNCR see the next step!

Step 11: Leds on SQNCR





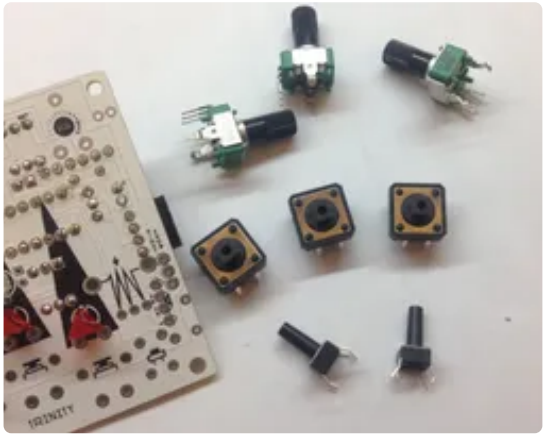


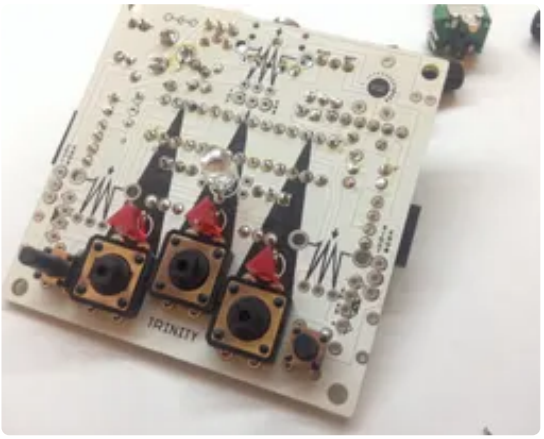
If you are not soldering SQNCR please skip this and proceed to the next one.

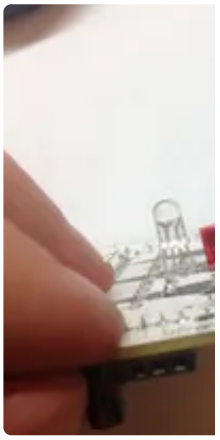
On SQNCR there are 3 small LEDs instead of one RGB LED. The middle one goes to the middle 2 holes of the RGB LED and the other 2 go to their slots with the same polarity + on the top side.

On board version v1.0 there might be issues with the 3 LEDs. Because some of the holes had to be drilled bigger, therefore it might have happened that some of the connections here got lost. If one of your little LEDs doesn't work try to remake the traces as on the pictures. This is fixed on 1.1 board.

Step 12: Buttons



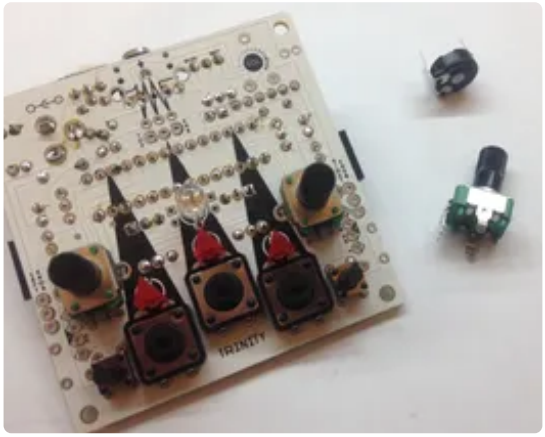


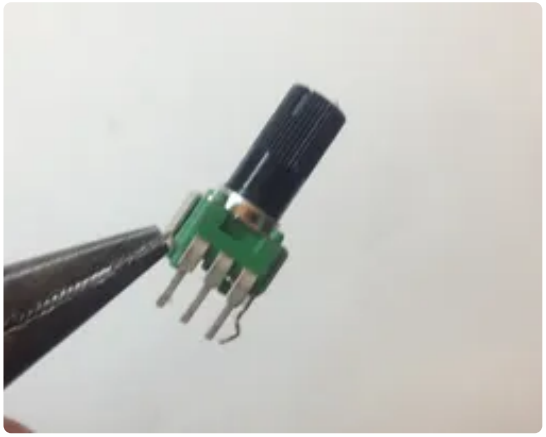


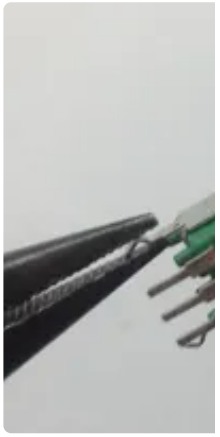
Place and solder the buttons. Make sure they are straight, otherwise you might have problems putting them through the housing.

Some Trinity versions (SQNCR and DRUM) do have **additional buttons** at each side of bottom part of board (*check last picture*).

Step 13: Knobs





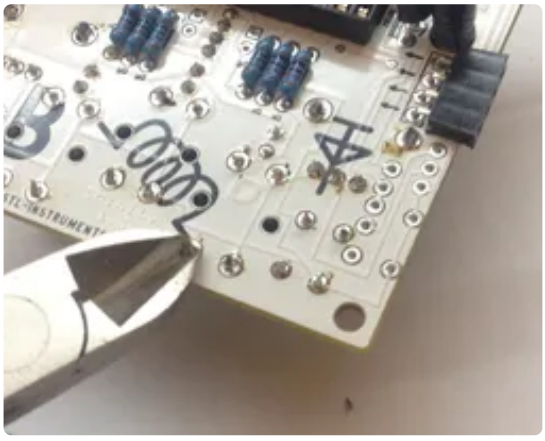


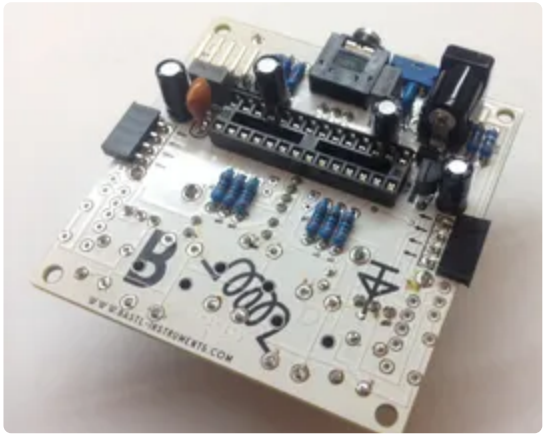
- Left and right knob are easy to place and solder.
- The top knob needs a bit of adjustment so it fits.
- The volume knob might also need a bit of adjustment so it fits the holes (only for version 1.0).

  You might need to solder it a bit from both sides, just to make sure the connection never breaks and you always have a good sound output.

Make sure knobs are soldered straight and as close to the PCB at its construction allows. Otherwise the PCB might not fit correctly into the housing!!!

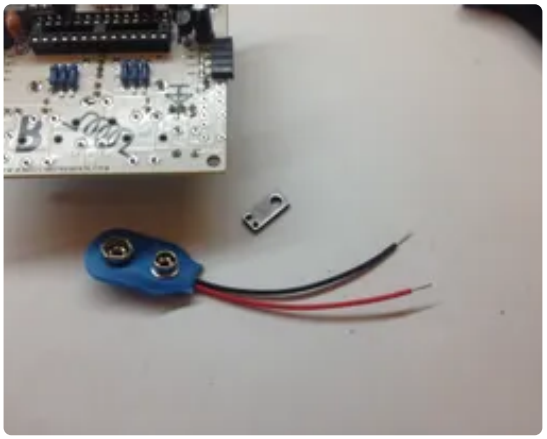
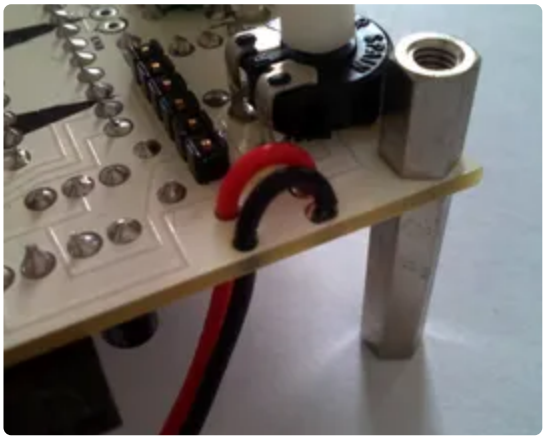
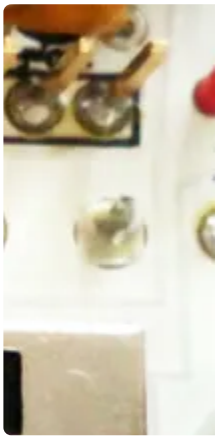
Step 14: Finishing





Make sure everything is soldered. Than cut the remaining pieces of buttons so the felt piece doesn't make a gap.

Step 15: Battery Clip

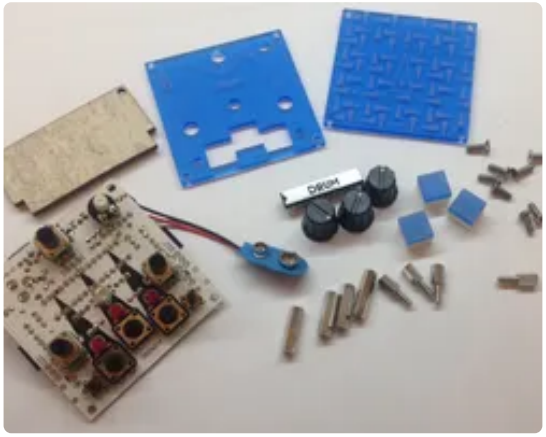




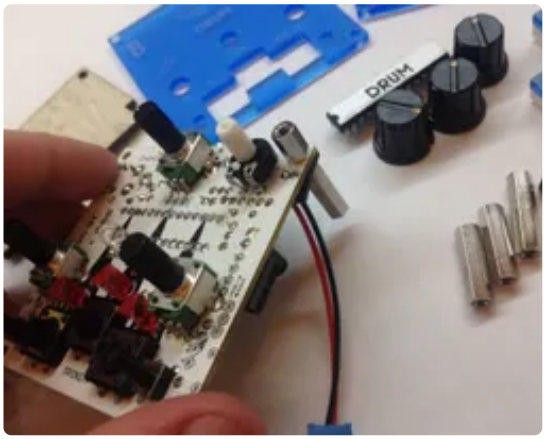
It is easier to put a bit of solder on the cable before you put it through the holes. Follow the polarity signs. Red is + (positive) and black is - (negative).

Version 1.2 solved problem with securing battery clip against ripping cable from board with simple solution. As you can see on picture, you have to put wire through holes dedicated to secure cables, before you solder them to board.

NOTE: on version 1.1 there is extra hole for holding the battery clip and plastic piece. Use the silver plastic piece which holds the cable so it does not break. Then use screw and bolt to fix that in place (the last picture of this step).

Step 16: Test Now!



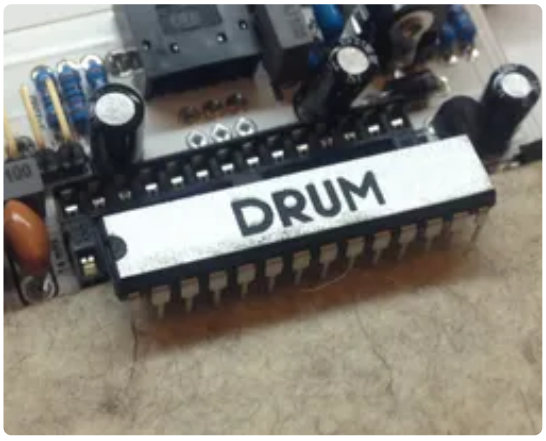


Well done, the soldering is over.

Before you dress up your trinity is really good idea to test that everything works (We'll put a debugging tutorial online soon). Everything works? Time to dress up! On board v1.0 there are 3 long spacers of the same length and one longer which compensates the height difference. Do the 3 first and then longer one, which goes next to the power jack connector.

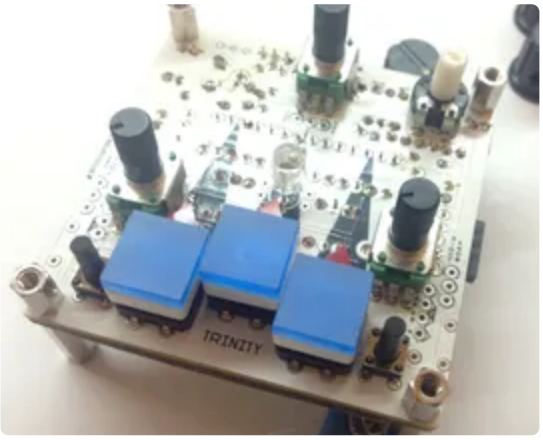
On board v1.1 all the spacers are the same length.

Step 17: Place the Chip



Follow the polarity indicated by the notch of the socket.

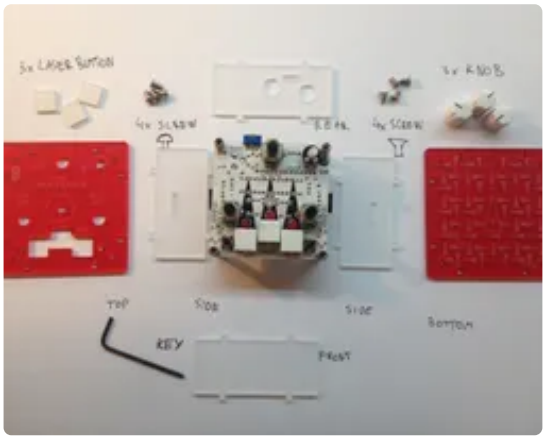
Step 18: Dress Up 1.0 - for 1.1 See the Next Step !!!

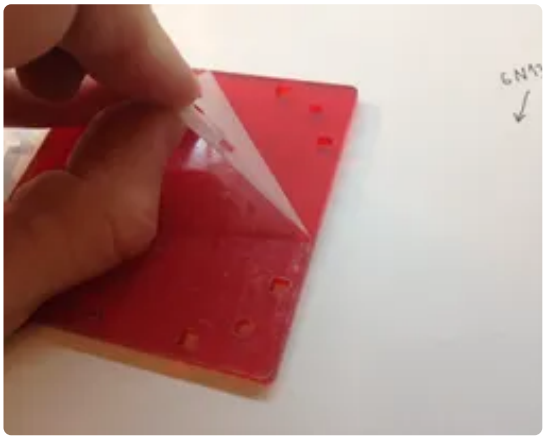


Putthe buttons in first. Match the front plate so all knobs and buttons go through and can be operated easily. Than screw it. Than pot the bottom plate.

Note: DON'T screw anything using force! Screw the bottom plate just right, so your battery holds nicely without too much tension.

Step 19: Dress Up and Finish for Version 1.1





The first picture shows where everything goes.

- If there are any foils on the plastic remove them first.
- Put the front side plate and put the screws very loosely !
- put in the rear plate and the side plates (let the engraved triangles face the outside - they are not visible much but will help you to put on the mushroom tape).
- Screw the top plastic now.
- Check if you can press easily all the buttons and tweak all the knobs - if not try to fix that by making them straight again.
- Now you can put in the felt protector and a 9V battery if you have.
- Put in the front side plate.
- Now fix the bottom plastic board with screws. Make sure the writings are aligned with the top board.
- Remove the tape cover from the laser-cut plastic button covers and glue them into place.
- Align the knobs with the markers on the potentiometers and fix them with

small flat screwdriver.

If you made it so far, congratulations ! You are done now!

Step 20: Done!

Fix the knobs so they don't touch the plate while you tweak them.

To turn on device, you can:

put the battery inside and **flip the switch to battery position**

OR

plug an adapter **and flip the switch to plug position**

Now connect speaker or headphones to check that everything works!

In case it does, go out and ROCK !

If you make some mods or tweaks, feel free to send us photos at info@bastl-instruments.com!

We would love to see what you guys can come up with!